

# Transonic Stability Test of Variable Drag Ballute, Phase I

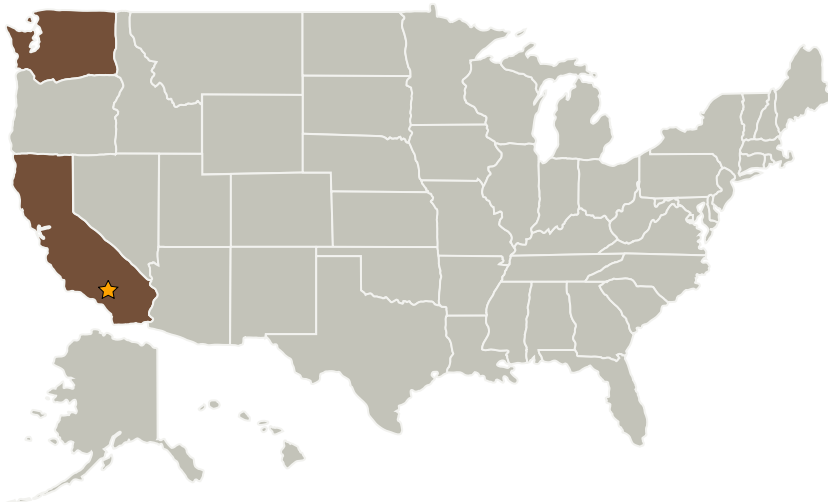
Completed Technology Project (2004 - 2004)



## Project Introduction

Low cost, reliable atmospheric entry technology is needed to support NASA cargo recovery from the ISS, earth return of small payloads, planetary aerocapture, and planetary probe missions. Fixed aeroshields and winged structures are well proven, but are not appropriate for many missions due to envelope, weight, and cost constraints. Inflatable ballute technology offers a low weight, cost effective alternative. Studies and demonstrations of ballute re-entry technology have focused on fixed drag designs (e.g., Small Payload Re-entry Inflatable Transporter (SPRINT), Inflatable Re-Entry Descent Technology (IRDT)). Fixed drag results in large downrange landing dispersions that cause regulatory and recovery challenges. A variable drag ballute significantly reduces downrange dispersions and allows trajectory tailoring to meet peak heating and deceleration constraints. Andrews Space is pursuing a variable drag ballute system for re-entry of payloads. The aerodynamic and aeroelastic behavior of the ballute during the transonic regime is a key development issue. The complexities of this flight regime warrant an early flight test. The Phase I objectives are to design a ballute transonic flight experiment, design the test unit, and define test requirements and plans. These preparations would lead to the construction and transonic flight testing of the variable drag ballute during Phase II.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission  
Directorate (STMD)

### Lead Center / Facility:

Armstrong Flight Research  
Center (AFRC)

### Responsible Program:

Small Business Innovation  
Research/Small Business Tech  
Transfer

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Organizations Performing Work	Role	Type	Location
★Armstrong Flight Research Center(AFRC)	Lead Organization	NASA Center	Edwards, California
Andrews Space, Inc.	Supporting Organization	Industry	Tukwila, Washington

Primary U.S. Work Locations	
California	Washington

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Dana G Andrews

## Technology Areas

**Primary:**

- TX09 Entry, Descent, and Landing
  - └ TX09.2 Descent
    - └ TX09.2.1 Aerodynamic Decelerators